

1 RECORD OF ORAL HEARING

2 UNITED STATES PATENT AND TRADEMARK OFFICE

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6 BEFORE THE BOARD OF PATENT APPEALS
7 AND INTERFERENCES
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10 Ex parte ~~HANS LIND et al.~~ HYEON JUN KIM and JI EUN LEE
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14 Appeal 2007-~~03762513~~
15 Application ~~+09/280,259~~ 785,443
16 Technology Center 2+600
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19 Oral Hearing Held: ~~March 8~~ September 12, 2007
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23 Before ~~JOSEPH F. RUGGIERO, KENNETH W. HAIRSTON, MAHSHID D.~~
24 ~~SAADAT, and ANITA PELLMAN GROSS, and~~
25 ~~ST. JOHN COURTENAY III, JEAN R. HOMERÉ,~~ *Administrative Patent*
26 *Judges,*
27

28 ON BEHALF OF THE APPELLANTS:
29

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39 The above-entitled matter came on for hearing on ~~Tuesday,~~

1Appeal 2007-2513

2Application 09/785,443

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1March 8Wednesday, September 12, -2007, commencing at 9:30 a.m.,-

2commencing at 9:00 a.m., at Fthe U.S. Patent and Trademark Office, 600

3Dulany Street, Alexandria, Virginia, before Cindy L. SeboLaurel P. Platt,

4Notary Public.

1 THE CLERK: Appeal number 2007-2513, Attorney Carol
2Druzick.

3 JUDGE RUGGIERO: Good morning.

4 MS. DRUZBICK: Good morning. Shall I go ahead?

5 JUDGE RUGGIERO: You may begin whenever you like.

6 MS. DRUZBICK: I am here for application serial number
7709/785,443.

8 Essentially this case is directed to a content-based retrieval system and
9method that uses color histograms.

10 Basically you have a query image, and you are searching for similar --
11a query image with a corresponding histogram that describes this, and you
12are searching for a similar image which also has a histogram.

13 A feature of this invention is that it converts -- in order to compare the
14histogram, the query histogram with the search histogram, it converts the
15histogram based on color space and color quantization method in order to
16compare them.

17 In the related art or the conventional art, you can only compare color
18histograms from different systems when the color space and the color
19quantization method were the same.

20 But the invention disclosed in the present application can convert -- it
21either converts the query image histogram or the histogram of the image to
22be retrieved into a histogram having a color space and color quantization
23measure of the other. This allows them to be compared.

24 It not only converts the color space, but what it does is it maps the
25subspaces of one color space into the quanti bins or a subspace of the other.
26And sometimes those overlap. It does that by mapping or projecting a

2volumetric ratio of a portion of the color space into the other color space.
3either directly or by sampling.

4. _____ Now, just to give a little background on a histogram and how you
5create a histogram, basically you pick a color space, and there are a bunch of
6different color spaces. One is called RGB, which stands for red, green, blue.
7And one is HSV, which stands for hue, saturation value. And there are
8several other ones.

9. _____ So you pick a color space. Basically it's a three-dimensional color
10graph, which is a three-dimensional shape. Then you quantize that color
11space to create the histogram.

12. _____ What you are doing is basically dividing the color space into
13subspaces or bins, and then you classify the pixels in the image. You
14basically assign them a value into that color space using an algorithm. And
15then you count the number of pixels in each bin.

16. _____ You count the number of pixels in each bin, and then you categorize
17them into the bins. And then what they usually do is normalize the value.
18take the number of pixels in each bin and divide it by the total number of
19pixels in the image. And then you assign a binary value to each bin.

20. _____ This is a way to describe basically color distribution in the image
21using descriptive information.

22. _____ So basically what ours does is it does this histogram conversion which
23allows you to do a similarity between histograms.

24. _____ Now, the rejection in the final office action dated July 13, 2004,
25rejected most of the claims over the referenced Bergman. So I'll basically --
26and then one Claim 12 over Bergman. I will basically be talking about

1Bergman.

2Now, it's applicant's contention that Bergman does not disclose this
3conversion of the histogram based on both color space and color
4quantization method.

5JUDGE GROSS: Where is the language based on? The claim 1.

6MS. DRUZBICK: Sure. Claim 1 has a histogram converter which
7converts the color histogram of one of the extracted query multimedia data
8and the multimedia data to be retrieved into a histogram having a color space
9and color quantization method of the other.

10So basically you're taking either your query histogram or your
11histogram of the image to be retrieved, and you are converting them so that
12they have the same color space and quantization method.

13JUDGE GROSS: Okay. But let's say we are converting from the
14query to the other, just so that we don't have to keep seeing either this or
15this.

16MS. DRUZBICK: Okay.

17JUDGE GROSS: If you start with RGB 512, so there's your color
18histogram for the query.

19MS. DRUZBICK: Yes.

20JUDGE GROSS: And you want to convert to -- what was the other
21one? -- HVS 512.

22MS. DRUZBICK: Yes.

23JUDGE GROSS: You are converting one histogram that has a color
24space and a color quantization method to another histogram which has a
25different color space. It has the same color quantization method, but it is a
26different histogram because one of the things is different. How does your

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1claim require that both things be different?

2MS. DRUZBICK: I think it does -- I think in the word the conversion

3-- converts. It converts the histogram and converts -- it would be changed.

4and so you're changing --

5JUDGE GROSS: The histogram is different; the color space is

6different. Correct?

7MS. DRUZBICK: It says it converts into a histogram having a color

8space and color quantization method of the other, so it would require both of

9the other.

10If you note, in some of the later claims saying that they're different

11from each other.

12JUDGE GROSS: I agree that Claim 13, for example, does require

13that both be different. It specifies when the color spaces and the color

14quantization methods are different. I don't disagree. But I don't see in Claim

151 that it requires that both be different.

16Claim 1 just says it converts one histogram that has two things into a

17color histogram that has two things, so that after the conversion is done, the

18two things are the same. But I don't see that it requires they start out with

19both being different. At least one has to be different or there's no

20conversion.

21But I don't see in the claim that it requires both be different until you

22get to, like I said, Claim 13.

23MS. DRUZBICK: I would agree that 13 is more explicit. But with

24this conversion -- I mean it says we are converting having both -- to the

25other one having both, meaning having a color space and quantization of the

26other. So I would say that, you know, into a histogram having a color space.

1 of the other and quantization method of the other.
2 JUDGE GROSS: Well, let's not harp on this. Continue.
3 MS. DRUZBICK: So basically I think you pretty much understand
4 what our position is. Our position is that Bergman teaches that you --
5 basically it's defining a relationship between one description type and
6 another standard description type, and they have to be derivatives.
7 I think it's very clear from Bergman that they have to be derivatives.
8 He doesn't address color quantization method whatsoever. He explicitly
9 states that they have to be derivatives. While he says the search engine 1902
10 must transform the query histogram hue into an appropriate histogram color
11 space, he doesn't address color quantization method.
12 And it's clear from the example that he gives that the quantization
13 method is the same and the color space has to be a derivative.
14 Ours, on the other hand, is capable of converting based on both color
15 space and color quantization method.
16 We've already talked about Claim 1.
17 Claim 6 has a method that has a similar step of converting, converting
18 a color histogram of one of the input query multimedia data and the
19 multimedia data to be retrieved into a color histogram having a color space
20 and color quantization of the other -- of the other of the input query
21 multimedia data and the multimedia data to be retrieved so as to be the same
22 as each other.
23 Claim 13 is a method with a converting step. As we previously
24 discussed, it says that when the color space and color quantization method of
25 extracting multimedia data and the multimedia data to be retrieved are
26 different from each other.

1 Claim 17 is also a method with a converting step converting the color
2histogram when the color space and color quantization method of the query
3multimedia data and the color space and color quantization method of the
4multimedia to be retrieved are different.

5 Going to Claim 28, this is a system claim which has a description
6means for describing color space and color quantization method of an
7extracted color histogram. And along with the first color quantizer, a second
8color quantizer which extracts a color histogram of query multimedia data
9using a method which is the same as the described color space and color
10quantization method in order to perform the multimedia data retrieval.

11 And then Claim 13 is a method with a judging step which judges
12whether a color histogram of query multimedia data corresponding to a color
13space and quantization method of multimedia to be retrieved is stored in
14advance and then calculating the similarity.

15 JUDGE GROSS: Let me ask you a question. Claim 32, where it talks
16about stored in advance before. Before what? Judging whether a histogram
17is stored in advance before and then there's a semicolon. Generally before
18has something following it.

19 MS. DRUZBICK: I think that that might be advances before -- an
20error. I think it's an error. But I will have to go back and check with my
21client on that.

22 JUDGE GROSS: Okay. Same as Claim 33.

23 MS. DRUZBICK: 33 also.

24 JUDGE GROSS: And 29.

25 MS. DRUZBICK: That I think may be a translation error.

26 JUDGE GROSS: Just so you know.

1 MS. DRUZBICK: Thank you.

2 JUDGE COURTENAY: The specification you broadly disclose is a
3system for retrieving multimedia data. Can you elaborate on that, expand on
4that, what actual application there is. Are you matching images according to
5their color histogram or images within images? And is it not possible to
6have two different images that might have the same color distribution or
7have the same color histogram even though they're different images?

8 MS. DRUZBICK: Yes. Yes. That's one of the drawbacks of
9histograms, is that they only do color distribution and not kind of spatial
10color -- spatial distribution. And so yes, but in --

11 JUDGE COURTENAY: I guess I'm asking for some additional
12insight as to the actual application. You broadly disclosed it.

13 MS. DRUZBICK: I think actual application is basically searching for
14image with a similar histogram.

15 JUDGE COURTENAY: And not so much trying to match a
16particular object according to the color histogram.

17 MS. DRUZBICK: I think that histograms are limited in their ability
18to do that.

19 JUDGE COURTENAY: Okay.

20 MS. DRUZBICK: There are a lot of further descriptive meanings that
21do spatial information that would give you that.

22 JUDGE COURTENAY: But this application is actually comparing
23images per se?

24 MS. DRUZBICK: It is comparing images per se, but it's comparing
25histograms.

26 JUDGE GROSS: So this would be the first step in trying to find a

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1matching image?

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3 MS. DRUZBICK: Yes or one. One of the information they used. So
4yes, it would probably be a step process.

5 Any further questions?

6 JUDGE RUGGIERO: Thank you.

7 MS. DRUZBICK: Thank you very much.

8 (Whereupon, the proceedings at 9:50 a.m. were concluded.)

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